REMARKS

Claims 8-12 and 22-34 are pending in the present application. Claim 8 has been amended. Claims 22-34 have been presented herewith. Claim 7 has been canceled.

Priority Under 35 U.S.C. 119

Applicants note the Examiner's acknowledgment of the Claim for Priority under 35 U.S.C. 119, and receipt of the certified copy of the priority document in parent application Serial No. 09/265,841.

Drawings

Applicants note the Examiner's acceptance of the drawings as filed along with the present application as formal drawings.

The Examiner has required that Figs. 7 and 8 be designated as "PRIOR ART". Accordingly, enclosed are two (2) sheets of red-inked drawings labeled "Annotated Marked-up Drawings" wherein Figs. 7 and 8(a)-8(d) have been denoted as "PRIOR ART". Also enclosed are two (2) sheets of corrected formal drawings labeled as "Replacement Sheet", incorporating the above noted corrections. **The Examiner is respectfully requested to acknowledge receipt and approval of corrected formal Figs. 7 and 8(a)-8(d).**

Specification

The title of the application has been amended as "TRANSFER MOLDING METHOD FOR MANUFACTURING SEMICONDUCTOR DEVICES", as requested by the Examiner. The Examiner is respectfully requested to approve the amended title.

Claim Objections

Claim 8 has been objected to under 37 C.F.R. 1.75 as being a substantial duplicate of claim 7. As noted above, claim 7 has been canceled. The Examiner is therefore respectfully requested to withdraw the objection to claim 8.

Claim Rejections-35 U.S.C. 102

Claims 7, 8 and 12 have been rejected under 35 U.S.C. 102(e) as being anticipated by the Weber reference (U.S. Patent No. 6,495,083). This rejection, insofar as it may pertain to the presently pending claims, is traversed for the following reasons.

The method for manufacturing semiconductor devices of claim 8 includes in combination "reducing an air pressure in a cavity formed by the top-half mold and the bottom-half mold when a specified amount of resin has been supplied into the cavity". Applicants respectfully submit that the Weber reference as relied upon by the Examiner does not disclose these features.

As described generally in the Summary of the Invention section in column 2, lines 41-44 of the Weber reference, the method includes underfilling a space between

the integrated circuit chip and the substrate with the mold compound by the pressure of injection of the mold compound into the mold cavity. As described in greater detail beginning in column 5, line 3 of the Weber reference with respect to Figs. 6-8, mold cavity pressure is controlled by mold vent 46 which allows some of the mold compound to escape from mold cavity 40 into overflow cavity 42. The size and shape of mold vent 46 is particularly designed so that a predetermined threshold pressure within the mold cavity at which solder bumps 20 would be crushed, is not reached. Overflow cavity 42 accommodates a sufficient amount of mold compound to provide pressure control during the underfilling process. As further described in column 5, lines 40-44, a multiple plunger system may be used to control the pressure of the mold compound being pressed into the mold cavities when the cavities are being filled.

As may be readily understood in view of the above noted portions, mold compound pressure within the mold cavities is controlled in the Weber reference by mold vent 46, which allows some of the mold compound from mold cavity 40 to escape. The Weber reference does not disclose reducing an air pressure in a cavity when a specified amount of resin has been supplied into the cavity, as featured in claim 8. The Weber reference therefore does not provide a method for manufacturing semiconductor devices which are free of voids in resin filled cavities, as in the present invention. Applicants therefore respectfully submit that the method for manufacturing semiconductor devices of claim 8 distinguishes over the Weber reference as relied upon by the Examiner, and that this rejection, insofar as it may pertain to claims 8 and

12, is improper for at least these reasons.

Claim Rejections - 35 U.S.C. 103

Claims 9-11 have been rejected under 35 U.S.C. 103(a) as being unpatentable over the Tsuzuku et al. reference (U.S. Patent No. 4,426,341) in view of the Saeki et al. reference (U.S. Patent No. 4,954,301). (Applicants presume that this rejection is in further view of the Weber reference, since claims 9-11 are dependent upon claim 8.) This rejection, insofar as it may pertain to the presently pending claims, is traversed for the following reasons.

As emphasized previously, the Weber reference does not disclose a method for manufacturing semiconductor devices including in combination reducing an air pressure in a cavity when a specified amount of resin has been supplied into the cavity, as featured in claim 8. Applicants respectfully submit that the Tsuzuku et al. and Saeki et al. references as relied upon by the Examiner also fail to disclose these features.

As described beginning in column 4, line 67 of the Tsuzuku et al. reference with respect to Fig. 4, cavity 8 includes mounted therein resin pressure sensor 15 for sensing the pressure of the resin within the cavity. As further described in column 5 of the Tsuzuku et al. reference, the position of plunger 6 is controlled by hydraulic pump 1 so that the value of resin pressure as sensed by resin pressure sensor 15 may be controlled. The Saeki et al. reference as relied upon by the Examiner merely discloses plunger driving control responsive to measured time and distance of the plunger.

Applicants thus respectfully submit that the Tsuzuku et al. reference and the Saeki et al. reference do not disclose a method for manufacturing semiconductor devices including in combination reducing an air pressure in a cavity when a specified amount of resin has been supplied into the cavity, as featured in claim 8. The Tsuzuku et al. reference and the Saeki et al. reference therefore do not overcome the deficiencies of the Weber reference. Applicants therefore respectfully submit that claims 9-11 distinguish over and would not have been obvious in view of the prior art as relied upon by the Examiner taken singularly or together, and that this rejection, insofar as it may pertain to the presently pending claims, is improper for at least these reasons.

Allowable Subject Matter

Applicants respectfully thank the Examiner for identifying allowable subject matter by way of the proposed claim on page 7 of the current Office Action. Claim 30 as presented herewith substantively corresponds to the proposed claim as suggested by the Examiner. Accordingly, the Examiner is respectfully requested to acknowledge that claims 30-34 are allowed.

Claims 22-29

The method of manufacturing a semiconductor device of claim 22 includes in combination "reducing a pressure in the cavity by extracting air from the cavity when a specified amount of resin has been supplied to the cavity". The method of

manufacturing a semiconductor device of claim 27 includes in combination "reducing a pressure in the cavity by extracting air from the cavity according to amount of time the plunger is driven". Applicants respectfully submit that the prior art as relied upon by the Examiner does not disclose the above noted features. Particularly, the prior art does not reduce pressure in a cavity by extracting air from the cavity, particularly when a specified amount of resin has been supplied to the cavity or according to an amount of time a plunger is driven, as respectively featured in claims 22 and 27. Applicants therefore respectfully submit that claims 22-29 distinguish over and would not have been obvious in view of the prior art as relied upon by the Examiner.

Conclusion

The Examiner is respectfully requested to reconsider and withdraw the corresponding rejections, and to pass the claims of the present application to issue, for at least the above reasons.

In the event that there are any outstanding matters remaining in the present application, please contact Andrew J. Telesz, Jr. (Reg. No. 33,581) at (703) 715-0870 in the Washington, D.C. area, to discuss these matters.

If necessary, the Commissioner is hereby authorized in this, concurrent, and future replies, to charge payment for any additional fees that may be required, or credit any overpayment, to Deposit Account No. 50-0238.

Respectfully submitted,

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Enclosures: Two (2) sheets of red-inked, annotated drawings
Two (2) Replacement Sheets of corrected formal drawings